

XXI. *The cost and value of Insect Collections.*

By DAVID SHARP, M.A., M.B., F.R.S., &c.

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THE discussions that have from time to time taken place as to the number of species of insects have had the result of making it pretty clear that if all the extant collections of insects were put together it would be probably found that they did not contain one-tenth part of the existing species. Moreover, this great general collection—if we can imagine it brought together—would be found dreadfully deficient in other respects; for instance, a large part of the species would be represented by only one, two, or three specimens; many of the individuals would be found to be in a very inferior state of preservation, and not a series would be found to illustrate either variation, geographical distribution, or metamorphosis, although these are essential points for a good collection. We should also discover that there were dreadful discrepancies as to the primary requisite, nomenclature. We should find in some cases several species standing under one name, and in others we should see individuals of the same species standing under different names. In other words, the world has made very little progress with the formation of a collection of insects. The enormous amount of enthusiasm, labour, devotion, and study bestowed on Entomology have as yet effected but little towards what is required.

There can be no doubt that the insect-fauna of the world is becoming greatly depauperated; one hears it from all sources. In our own country, in North America, in New Zealand, in Australia; insects that were formerly found in places are not there now. And I often ask myself whether the insects will not succeed in becoming extinct before mankind has become acquainted with them.

There are but few data accessible for the purpose of
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calculating the cost of insect collections. The chief item is the cost of collecting ; and by far the larger part of the collecting that has been, and is being, carried on, is done as a labour of love. The number of those who have persistently collected insects for the remuneration they could obtain for it has always been extremely small, though a good many have tried it and abandoned it, owing partly to their own want of skill, and partly to the uncertainty and inequality of the demand. In order to calculate the cost of a collection, one must in the first place put a value on the labour of the collector, and in doing this we must treat the matter from a purely business point of view. It is quite true that men whose time is worth £1000 or more per annum devote some of it to forming a collection of insects, and it is equally true that men who only realise £100 per annum are frequently quite as successful entomologically as their more expensive—if I may be pardoned the expression—colleagues. I believe, however, that if any one wished to secure an entomologist of good natural ability to collect for him permanently in Britain, he could find such a man for about £150 per annum ; and I take that therefore as the standard value of entomological labour. If we do this, and calculate what this labour should be expected to accomplish per annum over a number of years, we have then the data for approximating to the cost of a collection of insects.

Let us suppose the collector to be limited to making a collection of British insects, collecting them, mounting them, naming, and preserving them. I have no doubt he could progress at the rate of 6000 specimens, representing about 300 species, per annum. A very energetic and devoted man could do much more, but according to the conditions of our problem,—I am dealing with the case of ordinary men,—worth £150 per annum. And I am also taking into consideration the fact—and a very important one it is, as entomologists well know—that he is to secure the rare as well as the common species. If we take the number of species of British insects at 12,000, then, according to the above calculation, a fairly good collection of British insects, averaging twenty well-selected specimens of a species, would be formed in forty years at an expense of about £6000 ; and that, I think, is a very fair estimate. A collection of 12,000 species

of British insects, averaging twenty to a species, and thus consisting of 240,000 specimens, could, I think, be made for £6000, the average cost per specimen being 6d. It will be perhaps objected that I have allowed nothing for the cost of travelling, which must, of course, be incurred; but a little reflection will show that this would be very small under the conditions I am supposing, and would be more than recouped by the sale of duplicates.

The next point for consideration is the extent to which the preceding calculations must be modified in considering the cost of an ultra-British,—that is to say, a general,—collection.

At first sight it would appear that to make, in England, a collection of extra-British insects must be more expensive than making one limited to the indigenous creatures. And doubtless it would be, if all the departments of the work were undertaken by one man, as I have supposed to be the case in the formation of a British collection.

The efforts of one man in forming a general collection of the insects of the world would, however, be thrown away, and for this larger purpose the combination of a number of employés would be essential; and in that case the advantages derived from division and organisation of labour would more than compensate for the fact that some of the operations have to be carried on in distant parts of the world. We will, however, suppose that only similar progress should be expected for like expenditure, and then multiplying our factors by twenty we arrive at the result that for an annual expenditure of £3000 a general collection of insects progressing over a long series of years at the rate of 6000 species and 120,000 specimens of selected insects could be collected, mounted, arranged, and preserved.

This estimate of the rate of progress that might be made is a very moderate one, as can readily be ascertained by checking it in the converse manner of arranging a staff, calculating the cost and the results that it could attain. It is then seen that the above sum is sufficient for attaining the result mentioned.

Cost and value are very different things, so that when we come to consider the value of collections we have to take a wider view than we have done when considering

their cost. We may, however, dismiss the question of the value of entomological collections to individuals with a very few words, because each individual is the best judge of the value he himself puts on a collection. We know that collections of insects never pay in money those who have formed them for the labour and time they have bestowed on the work ; and I do not suppose any private person ever undertakes the formation of a collection for himself with the expectation of recouping a sum of money as an equivalent for his time and labour. Any one who did so would probably be disappointed.

But there are reasons why a public collection has, or rather should have, a much greater value relative to its cost than is the case with private collections. These are—1. The fact that a public collection continues to exist for a great number of years, and, if intelligently formed and properly arranged, would acquire a constantly increasing value from its historical associations, and from the extinction in nature of the species contained in it. 2. The fact that a public collection receives great increments from private individuals, without anything like a corresponding expenditure on its part. 3. That the educational and hedonic results of a collection are, or should be, in the case of a public one, extended over a greater number of individuals without any corresponding increase in its cost.

These considerations not only amply justify the formation of public collections, but also render it certain that it is worth while the work should be well done ; indeed, the considerations render it very evident that the value of the collections depends almost entirely on their being undertaken and carried on in an efficient manner.

It may not be superfluous to deal with these reasons at somewhat greater length. When we recollect that a large copper butterfly was worth a few years ago about a shilling, and at the present time about six pounds, and that the chain of causes that have led to this increase of value are at work in the case of a large number of other insects, we recognise that the increment of value from this source is far from unimportant. If the spread of the white races over the globe continue to go on as rapidly as it has done, it is certain that there will be a great increase in the value of very many specimens that can now be procured for a very small expenditure.

The historical value that should attach to public collections, I cannot enlarge on, because it has hitherto been nearly entirely sacrificed by the unintelligent manner in which public collections of insects are formed and arranged. Certain specimens and certain labels will be found in a drawer, but what the connection between the two is or was cannot after a few years be ascertained. We could almost suppose, from the way in which they carry out their task, that the reflection that man is mortal has never occurred to those engaged in the formation of public collections of insects.

But the greatest of the advantages that a public collection has over a private one, so far as the relation between cost and value is concerned, doubtless exists in the fact that the former might expect to receive, and doubtless with wise arrangements would receive, very extensive assistance from private individuals. Such assistance is already to some extent given, and if arrangements were made with the object of leaving to private individuals the work they prefer doing, and of fostering the interest such persons feel in the public collections, there would beyond doubt be a still greater advantage accruing from such assistance. Hence we may expect a very much more rapid increase than that we have mentioned as the minimum that can be accepted as satisfactory progress. So that, instead of the position we find at present, *viz.*, that each public collection of insects is getting more and more hopelessly in arrear of the general progress, it might be fairly anticipated that a good public collection would keep fully abreast of the advance of knowledge. And this for the expenditure of such a sum as I have mentioned would be very good value indeed.

In the considerations we have entered into the chief point kept in view has been the extension of general collections intended for the advancement of knowledge. The questions connected with the exhibition of specimens with a view to the diffusion of knowledge amongst the people have not been in any way alluded to, as they form a quite distinct subject. To enter here on a consideration of the number of persons in the community that would directly benefit by the existence of a good public collection would not be profitable, because it must be complicated by considerations as to the relations

between the two great objects of collections, the advancement of knowledge and its diffusion. But it will be clear to all entomologists that the number of persons who would derive direct pleasure and satisfaction from the existence of an adequate public collection of insects for the advancement of knowledge is by no means inconsiderable.

It thus appears that though it is not worth while for a private individual to make a collection of insects, yet a public collection, if efficient, would offer a good value in return for its cost.